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TESTING
CNAS L0446

GRGTEST

Page 1 of 21

Test Report

Verified code: 269579

Report No.: E20240506136401-12

Customer: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

Sample Name: Vibration Sensor T1

Sample Model: VB-S01D

Receive Sample Date: May.10, 2024

Test Date: Aug.19,2024 ~ Aug.19,2024

Reference Document: AS/NZS CISPR 32:2015

Test Result: Pass

Prepared by:

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Reviewed by:

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Approved by:

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Xiao Liang

GRG METROLOGY & TEST GROUP CO., LTD.

Issued Date: 2024-09-02

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20240506136401-12	Original Issue	2024-08-31

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1. TEST RESULT SUMMARY

Emissions

Test Item	Test mode	Equipment test requirement	Test Method	Class / Severity	Test Result
Radiated Emission	Mode 1 to mode 2	AS/NZS CISPR 32:2015 C.3.4	AS/NZS CISPR 32:2015 C.3.4 Table A.4 Class B Table A.5 Class B	Table A.4 Class B Table A.5 Class B	PASS
Conducted Emission	/	AS/NZS CISPR 32:2015	AS/NZS CISPR 32:2015 C.3.5	Table A.10 Class B	Not Applicable ¹

Note 1: The EUT is power by battery, not applicable.

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2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name: Lumi United Technology Co., Ltd
 Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.2 MANUFACTURER

Name: Lumi United Technology Co., Ltd
 Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment: Vibration Sensor T1

Model No.: VB-S01D

Adding Model: /

Trade Name: Aqara

Power Supply: 3.0V DC supplied by button cell

Battery CR2032 3.0V DC

Specification:

Frequency Band: 2405MHz-2480MHz

Sample submitting way: Provided by customer Sampling

Sample No: E20240506136401-0004

Note: The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

2.4 TEST MODE

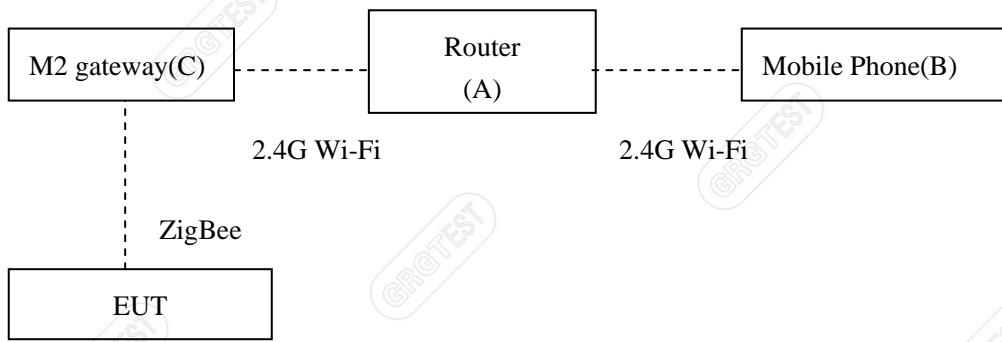
Mode No.	Description of the modes
Mode 1	Test that the peripheral mobile phone is connected to the router through Wi-Fi-2.4G, connect the EUT to the mobile phone's APP, the EUT link to the M2 gateway through Zigbee, the M2 gateway link to the router through Wi-Fi-2.4G, then use APP software to enable the EUT communication with M2 gateway and click the APP software make the EUT in detects the vibration and movement of objects mode.
Mode 2	EUT standby.

2.5 LOCAL SUPPORTIVE INSTRUMENTS

No.	Name of Equipment	Manufacturer	Model	Serial Number	Note
A	Router(A)	INNBOX	SBB1177HO	/	/
B	Mobile Phone	VIVO	VIVO Y79	/	/
C	M2 gateway	Aqara	M2	/	/
Cable					
/	/	/	/	/	/

2.6 CONFIGURATION OF SYSTEM UNDER TEST

Mode 1:



Mode 2:



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3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

Add.: No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District
Shenzhen, 518110, People's Republic of China.

P.C.: 518110

Tel : 0755-61180008

Fax: 0755-61180008

3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

China CNAS(L0446)

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4. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Radiated Emission	30MHz~200MHz(H)	4.6dB ¹⁾
	200MHz~1000MHz(H)	4.8dB ¹⁾
	1GHz~12.75GHz(H)	5.0dB ¹⁾
	30MHz~200MHz(V)	4.7dB ¹⁾
	200MHz~1000MHz(V)	4.7dB ¹⁾
	1GHz~12.75GHz(V)	5.1dB ¹⁾
Note: ¹⁾ This uncertainty represents an expanded uncertainty expressed at approximately the 95%. This uncertainty represents an expanded uncertainty factor of $k=2$.		

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5. LIST OF USED TEST EQUIPMENT AT GRGT

5.1 LIST OF USED TEST EQUIPMENT

Name of equipment	Manufacturer	Model	Serial number	Calibration due
Radiated Emission (Below 1GHz)				
Test software	FARAD	EZ_EMU	CCS-03A1	/
Test Receiver	R&S	ESR26	101758	2024-09-22
Amplifier	SHIRONG ELECTRONIC	DLNA-30M1G-G41	20200928003	2024-10-24
Bi-log Antenna	Schwarzbeck	VULB 9160	VULB9160-3402	2024-10-06
Radiated Emission (Above 1GHz)				
Test software	Tonscend	JS32-RE	/	/
Test Receiver	R&S	ESR26	101758	2024-09-22
Preamplifiers	Tonscend	TAP01018048	AP20E8060075	2025-03-01
Horn antenna	Schwarzbeck	BBHA 9120D	02143	2024-09-23
Preamplifier	SHIRONG ELECTRONIC	DLNA-1G18G-G40	20200928005	2025-07-19

Note: The calibration cycle of the above instruments is 12 months.

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6. EMISSION TEST

6.1 RADIATED EMISSION MEASUREMENT (RE)

Test Requirement: AS/NZS CISPR 32:2015

Test Method: EN 55032 /annex A.2

6.1.1 LIMITS

The ancillary equipment shall meet the class B limits given in CENELEC EN 55032 [1], annex A tables A.4 and A.5.

Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for class B equipment

Frequency range(MHz)	Distance (m)	Bandwidth	Limits (dBuV/m)		
			Peak (PK)	Quasi-peak (QP)	Average (Avg)
30~230	3	120kHz	/	40	/
230~1000	3	120kHz	/	47	/

Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for class B equipment

Frequency range(MHz)	Distance (m)	Bandwidth	Limits (dBuV/m)		
			Peak (PK)	Quasi-peak (QP)	Average (Avg)
1000~3000	3	1MHz	70	/	50
3000~6000	3	1MHz	74	/	54

6.1.2 TEST PROCEDURE

(1) Procedure of Preliminary Test

Radiated emission tests shall be made with the receive or transmit antenna located at a horizontal distance of 3m plus half of the maximum width of the EUT being tested, measured from the centre of the EUT. The tests shall be performed with the equipment configured as closely as possible to its typical, practical operation. Unless stated otherwise, cables and wiring shall be as specified by the manufacturer and the equipment shall be in its housing (or cabinet) with all covers and access panels in place. Any deviation from normal EUT operating conditions shall be included in the test report.

The EUT (on a non-conductive support structure, where applicable) shall be placed on a remotely operated turntable, to allow the EUT to be rotated. The height of the EUT above the ground plane shall be according to the following requirements.

-- Table-top equipment is placed on a non-conductive set-up table with height $0.8\text{ m} \pm 0.01\text{ m}$, CISPR 16-1-4 specifies the method to determine the impact of the non-conductive set-up table on test results.

-- Floor-standing equipment is placed on a non-conductive support, as specified in the applicable product standard. If there are no EUT height placement requirements in the product standard, the EUT shall be placed on a non-conductive support at a height of 5 cm to 15 cm above the ground plane.

Note: This is table-top equipment.

Interface cables, loads, and devices should be connected to at least one of each type of the interface ports of the EUT and, where practical, each cable shall be terminated in a device typical for its actual use. Where there are multiple interface ports of the same type, a typical number of these devices shall be connected to devices or loads. It is sufficient to connect only one of the loads, provided that it can be shown, for example by preliminary testing, that the connection of further ports would not significantly increase the level of disturbance (that is, more than 2 dB) or significantly degrade the immunity level.

The test mode(s) were scanned during the preliminary test. After the preliminary scan, we found the test mode producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

(2) Procedure of Final Test

EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test. The Analyzer/ Receiver scanned from 30MHz to 1000MHz and 1000MHz to 6000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level. Record at least six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and for 30MHz~1000MHz only QP reading is presented, for 1000MHz~6000 MHz Peak and AVG reading is presented.

6.1.3 TEST SETUP

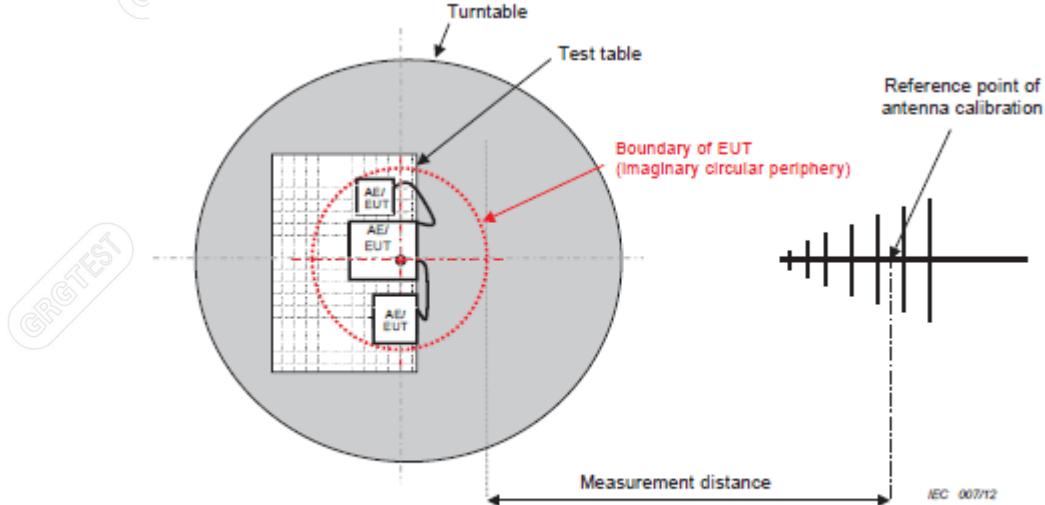


Figure C.1 – Measurement distance

Below the frequency of 1GHz

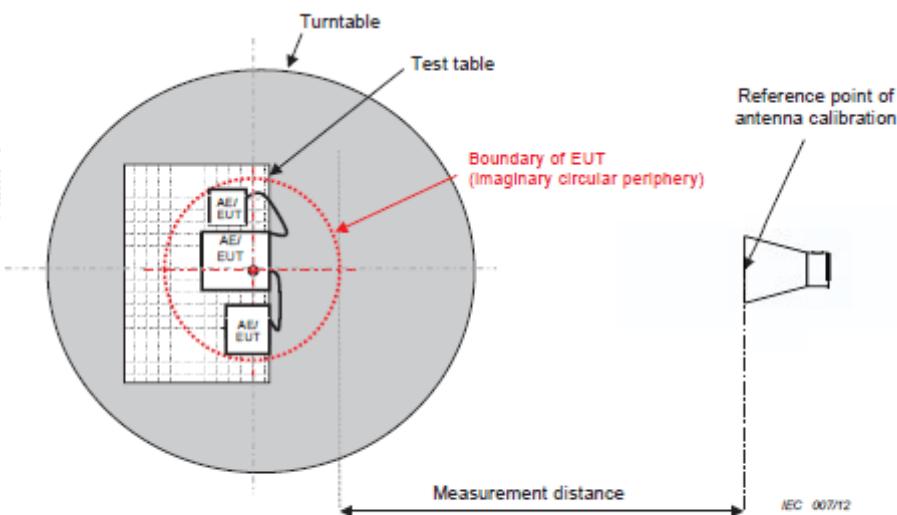


Figure C.1 – Measurement distance

Above the frequency of 1GHz(1GHz-6GHz)

6.1.4 DATA SAMPLE

Below 1GHz

NO.	Freq. [MHz]	Reading [dB μ V/m]	Correct Factor [dB/m]	Result (dB μ V/m)	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Remark
xxx	32.91	51.35	-17.84	33.51	40.00	-6.49	100	321	QP

Frequency (MHz) = Emission frequency in MHz

Reading (dB μ V/m) = Uncorrected Analyzer / Receiver reading

Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain

Result (dB μ V/m) = Reading (dB μ V/m) + Correct Factor (dB/m)

Limit (dB μ V/m) = Limit stated in standard

Margin (dB) = Result (dB μ V/m)-Limit (dB μ V/m)

QP = Quasi-peak Reading

Above 1GHz

NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
xxx	xxx	54.73	34.97	-19.76	74.00	39.03	200	308	Vertical	PASS

Frequency (MHz) = Emission frequency in MHz

Reading (dB μ V/m) = Uncorrected Analyzer / Receiver reading

Factor (dB) = Antenna factor + Cable loss – Amplifier gain

Level for 1m (dB μ V/m) = Reading (dB μ V/m) + Factor (dB)

Level for 3m (dB μ V/m) = Level for 1m (dB μ V/m) + 20*log(1/3)

Limit (dB μ V/m) = Limit stated in standard

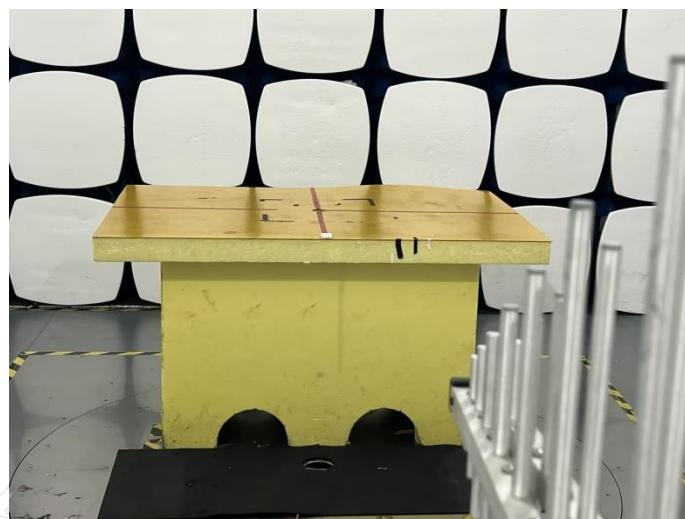
Margin (dB) = Limit (dB μ V/m) – Level (dB μ V/m)

Polarity = Antenna polarization

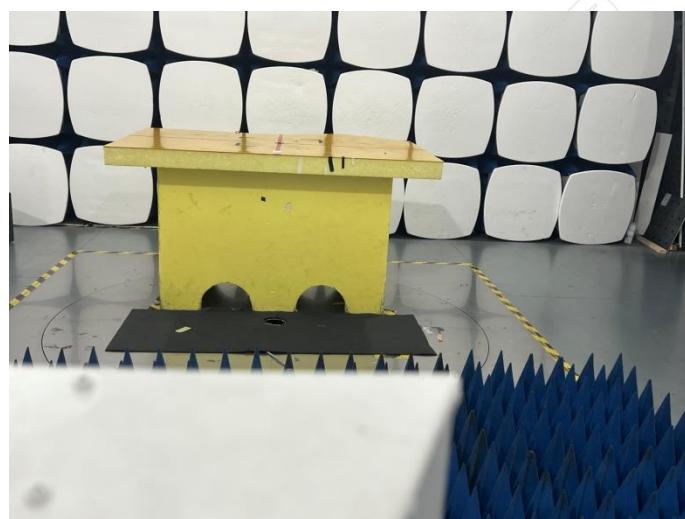
Peak = Peak Reading

AVG = Average Reading

6.1.5 PHOTOGRAPH OF THE TEST ARRANGEMENT



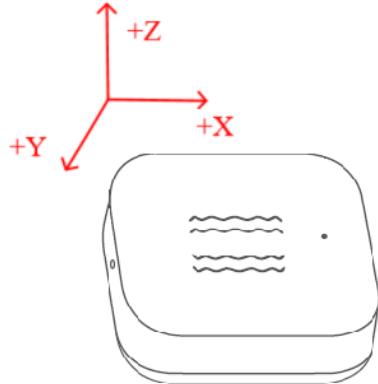
Below 1GHz



Above 1GHz

6.1.6 TEST RESULTS

The test are under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown the X position only.



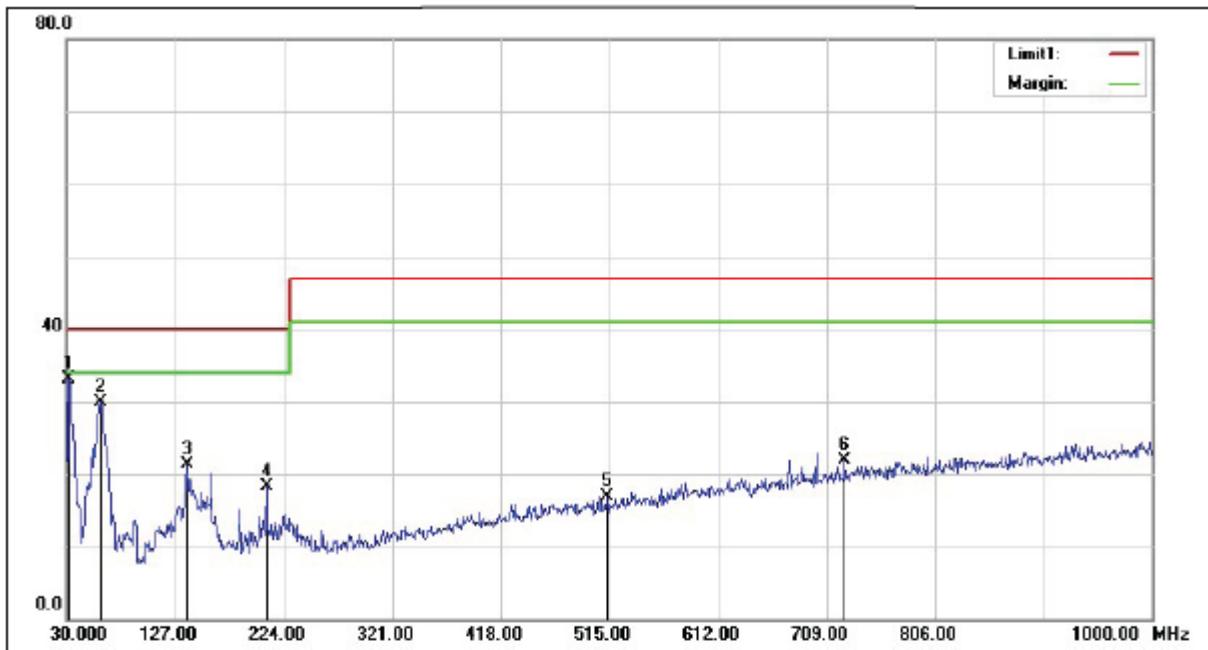
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Pretest all case, only the worst case mode 1 test results were recorded in this report.

Below 1GHz

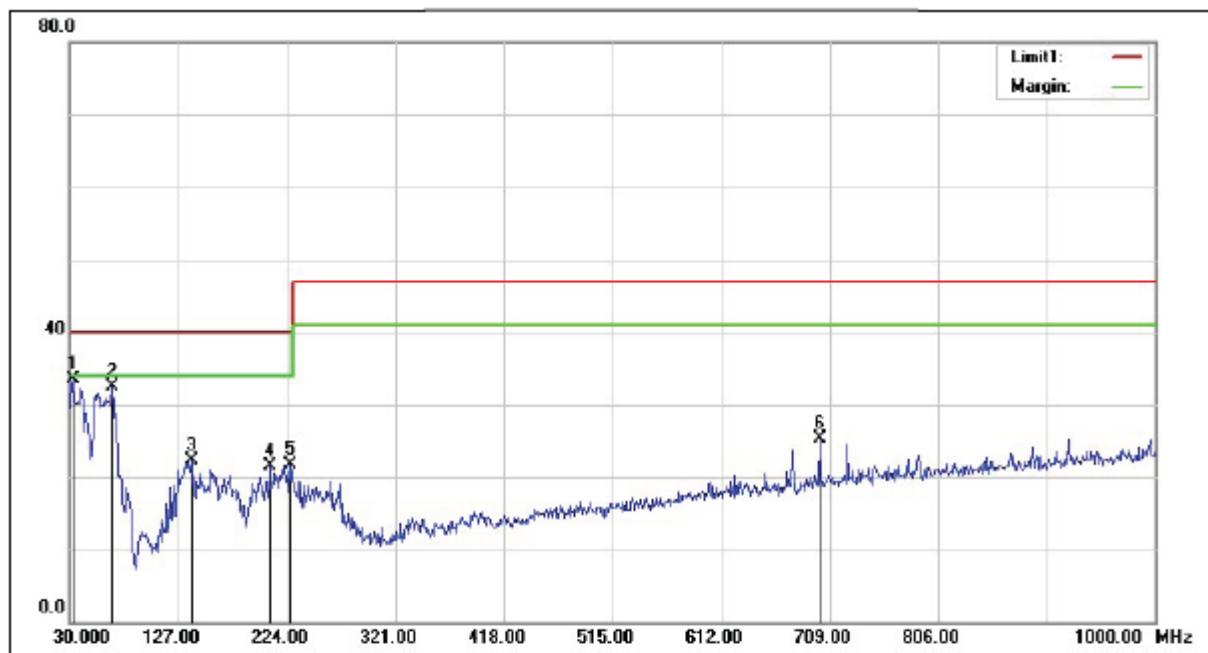
Environmental Conditions	24.9°C/64%RH/101.0 kPa	Test Mode	Mode 1
Power supply	DC 3V	Tested By	Wen wenwen
Test Date	2024-08-19	/	/

Polarity: Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1*	31.9400	50.98	-17.89	33.09	40.00	-6.91	100	360	QP
2	60.0700	47.42	-17.58	29.84	40.00	-10.16	100	360	QP
3	137.6700	37.29	-16.01	21.28	40.00	-18.72	130	0	QP
4	208.4800	36.96	-18.60	18.36	40.00	-21.64	110	0	QP
5	513.0600	26.11	-9.20	16.91	47.00	-30.09	200	177	QP
6	725.4900	26.35	-4.53	21.82	47.00	-25.18	100	212	QP

Polarity: Vertical

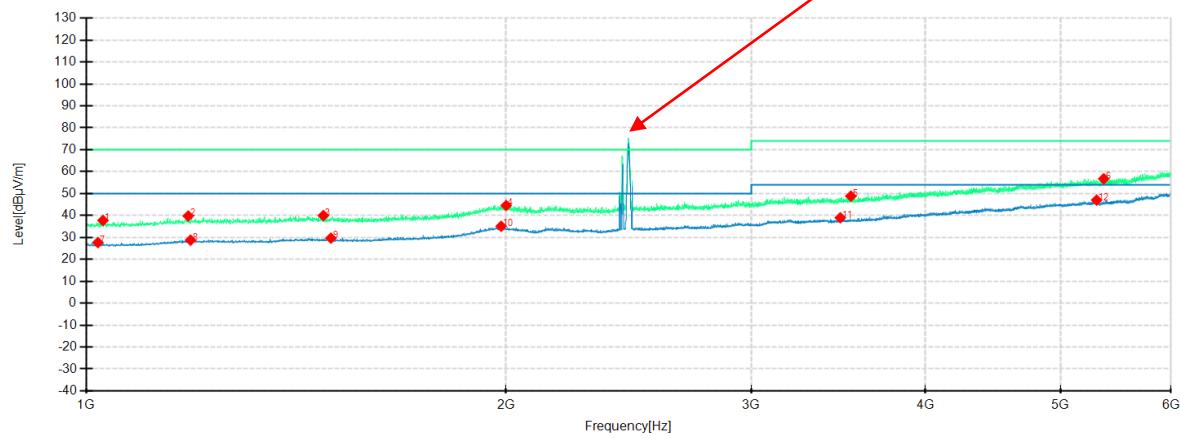


No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1+	32.9100	51.26	-17.84	33.42	40.00	-6.58	100	101	QP
2	67.8300	51.15	-18.66	32.49	40.00	-7.51	100	1	QP
3	138.6400	38.28	-15.91	22.37	40.00	-17.63	100	112	QP
4	208.4800	40.14	-18.60	21.54	40.00	-18.46	100	49	QP
5	226.9100	39.07	-17.41	21.66	40.00	-18.34	100	355	QP
6	700.2700	30.23	-5.02	25.21	47.00	-21.79	200	156	QP

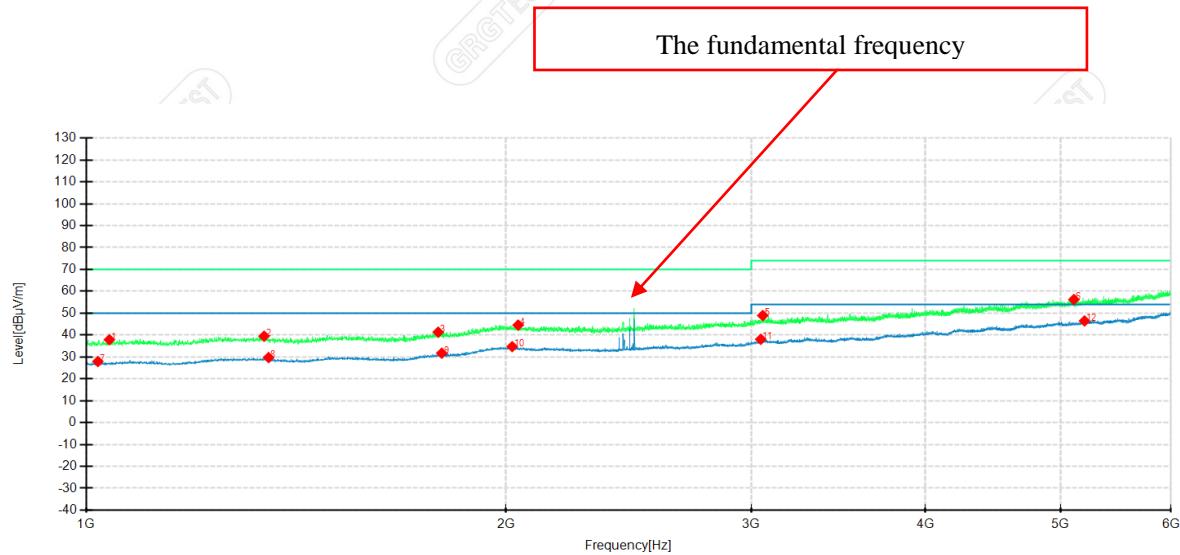
Above 1GHz

Environmental Conditions	25.6°C/64%RH/101.0 kPa	Test Mode	Mode 1
Power supply	DC 3V	Tested By	Wen wenwen
Test Date	2024-08-19	/	/

The fundamental frequency

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dB μ V/m]	Level [dB μ V/m]	Factor [dB]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1028.0000	49.40	37.75	-11.65	70.00	32.25	100	278	Horizontal
2	1183.5000	50.01	39.78	-10.23	70.00	30.22	200	265	Horizontal
3	1479.5000	49.38	39.99	-9.39	70.00	30.01	100	247	Horizontal
4	2001.0000	48.93	44.55	-4.38	70.00	25.45	100	92	Horizontal
5	3536.0000	49.79	48.84	-0.95	74.00	25.16	100	324	Horizontal
6	5369.0000	50.08	56.75	6.67	74.00	17.25	100	92	Horizontal
7	1019.5000	39.31	27.66	-11.65	50.00	22.34	100	278	Horizontal
8	1188.0000	38.94	28.75	-10.19	50.00	21.25	200	249	Horizontal
9	1498.0000	39.14	29.68	-9.46	50.00	20.32	200	81	Horizontal
10	1984.5000	39.54	35.09	-4.45	50.00	14.91	100	60	Horizontal
11	3475.0000	40.15	38.97	-1.18	54.00	15.03	200	280	Horizontal
12	5306.5000	40.24	47.02	6.78	54.00	6.98	200	128	Horizontal



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1039.0000	49.08	37.88	-11.20	70.00	32.12	200	169	Vertical
2	1341.5000	49.00	39.49	-9.51	70.00	30.51	200	262	Vertical
3	1788.5000	49.14	41.33	-7.81	70.00	28.67	100	176	Vertical
4	2041.0000	49.18	44.56	-4.62	70.00	25.44	200	77	Vertical
5	3057.0000	50.34	48.93	-1.41	74.00	25.07	100	269	Vertical
6	5111.0000	49.64	56.22	6.58	74.00	17.78	100	284	Vertical
7	1019.5000	39.32	27.91	-11.41	50.00	22.09	200	293	Vertical
8	1351.5000	39.26	29.73	-9.53	50.00	20.27	100	22	Vertical
9	1799.0000	39.42	31.72	-7.70	50.00	18.28	200	15	Vertical
10	2021.0000	39.21	34.71	-4.50	50.00	15.29	200	278	Vertical
11	3047.0000	39.50	38.07	-1.43	54.00	15.93	100	22	Vertical
12	5201.5000	39.43	46.45	7.02	54.00	7.55	100	129	Vertical

Remark: The fundamental frequency or multiple of fundamental frequency's limit is controlled to the standard of Radio frequency.

APPENDIX A. PHOTOGRAPHS OF EUT

Please refer to the attached document E20240506136401-EUT photo.

----- End of Report -----